

## B. NATURE OF SCIENCE

<p><b>Content Standard:</b> Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.</p> <p><b>Rationale:</b> Students will realize that scientific knowledge is developed from the activities of scientists and others who work to find the best possible explanations of the natural world. Researchers and those who are involved in science follow a generally accepted set of rules to produce scientific knowledge that others can confirm through experimentation. This knowledge is public, replicable, and undergoing revision and refinement based on new experiments and data.</p>			
<b>Performance Standards: By the end of grade four students will:</b>	<b>Sample Alternate Performance Indicators: (1-3 per standard)</b>	<b>Sample Performance Activities/Tasks: (1-2 per indicator)</b>	<b>Sources of Data</b>
B.4.1. Use encyclopedias, source books, texts, computers, teachers, parents, other adults, journals, popular press, and various other sources, to help answer science-related questions and plan investigations [2]	<p>1. Identify and locate sources to answer science-related questions. [2]</p> <p>2. Use the parts of a book to locate information (index, table of contents, glossary) [2]</p> <p>3. Use sources to plan an investigation of a problem [2]</p>	<p>1.a. Match science-related questions to given sources (1)</p> <p>1.b. Participate in a library search for sources (2)</p> <p>2.a. Complete an information gathering and/or parts of the book treasure hunt(2)</p> <p>3.a. Draw a picture, write a paragraph, or do a demonstration to summarize the answer to a question (2)</p>	
B.4.2. Acquire information about people who have contributed to the development of major ideas in the sciences and learn about the cultures in which these people lived and worked [1]	<p>1. Identify and describe contributors to the development of major ideas in the sciences [1]</p> <p>2. Acquire information about a contributor to the science field [1]</p>	<p>1.a. Identify a person from the student's native country or other country of choice who has contributed to the sciences (1)</p> <p>2.a. Interview a chosen person(1)</p> <p>2.b. Describe a person through a picture, word map, portfolio, demonstration, or skit (1)</p>	
B.4.3. Show how the major developments of scientific knowledge in the earth and	1. Identify the major developments of scientific knowledge [1]	1.a. Select the most important developments in scientific knowledge given pictures representing both important and less important developments (2)	

space, life and environmental, and physical sciences have changed over time [1]	2. Sequence the major developments of scientific knowledge [1]	1.b. Discuss changes in technology in the student's own experiences, for example, technology in their native country, changes in this country during the student's life (3)  2.a. Create a pictorial or key word timeline of the major identified developments of scientific knowledge (1)	
<b><i>Performance Standards: By the end of grade eight students will:</i></b>	<b><i>Sample Alternate Performance Indicators: (1-3 per standard)</i></b>	<b><i>Sample Performance Activities/Tasks: (1-2 per indicator)</i></b>	<b><i>Sources of Data</i></b>
B.8.1. Describe how scientific knowledge and concepts have changed over time in the earth and space, life and environmental, and physical sciences[1]	1. Describe changes in scientific knowledge and concepts [1]  2. Recognize previous misconceptions in scientific knowledge [1]	1.a. Interpret various models of flat vs. round examples of the earth (2)  1.b. Differentiate between historical and modern-day models of flight (2)  2.a. Develop a word map of misconceptions as they relate to current beliefs(2)	
B.8.2. Identify and describe major changes that have occurred over time in conceptual models and explanations in the earth and space, life and environmental, and physical sciences, and identify the people, cultures, and conditions that led to these developments [1]	1. Identify and describe major changes that have occurred over time in conceptual models [1/2]	1.a. Match the scientist with the scientist's theory (1)	
B.8.3. Explain how the general rules of science apply to the development and use of evidence in science investigations, model-making, and applications [2]	1. Explain the application of general rules of science to the development of evidence in science applications [2]  2. Explain the application of the	1.a. Use measurements of volume and mass to categorize items.(2)  1.b. Use states of matter to classify objects in the universe  2.a. Upon completion of solar system research, construct a	

	general rules of science to the use of evidence in model-making [2]	scale model of the solar system (2/3)  2.b. Provide examples of statements or actions based on evidence and statements or actions that are based on desires and prejudices (2)	
B.8.4. Describe types of reasoning and evidence used outside of science to draw conclusions about the natural world [2]	1. Describe types of reasoning used outside of science to draw conclusions about the natural world [2]	1.a. Compile examples of folklore explaining the natural world (2)	
B.8.5. Explain ways in which science knowledge is shared, checked, and extended, and show how these processes change over time [2]	1. Explain ways in which science knowledge is shared and how this has changed [2]	1.a. Construct two word webs to identify ways scientists are currently able to share research information and ways they were able to share research information in the past (2)	
B.8.6. Explain the ways in which scientific knowledge is useful and also limited when applied to social issues [3]	1. Explain the uses and limitations of scientific knowledge when applied to social issues	1.a. Investigate a science related social issue such as cloning or stem cell therapy (3)	
<b>Performance Standards: By the end of grade twelve students will:</b>	<b>Sample Alternate Performance Indicators: (1-3 per standard)</b>	<b>Sample Performance Activities/Tasks: (1-2 per indicator)</b>	<b>Sources of Data</b>
B.12.1. Show how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences	1. Identify and describe people or cultures that have contributed to the development of major ideas in the sciences  2. Acquire information about people or cultures that contributed to science	1.a. Identify contributors to the sciences from the student's native country  2.a. Describe a person or culture through a picture, word map, portfolio, demonstration, or skit	
B.12.2. Identify the cultural	1. Identify discoveries, developments	1.a. In groups, create a collage, web, or other visual to show	

conditions that are usually present during great periods of discovery, scientific development, and invention	and inventions during a period  2. Describe conditions present during great periods of discovery, scientific development, and invention	advancements during the Industrial Revolution  2.a. Identify the cultural conditions present during the Industrial Revolution	
B.12.3. Relate the major themes of science to human progress in understanding science and the world	1. Explain changes in scientific thinking throughout history	1.a. Compare and contrast the thinking of various scientists (e.g., Aristotle, Copernicus, Gallileo, Newton, and Einstein). Show how these scientists challenged the commonly held world view of their time	
B.12.4. Show how basic research and applied research contribute to new discoveries, inventions, and applications	1. Illustrate research's importance to a discovery, invention or application	1.a. Using a teacher-created form, web, graphic organizer or visual, present information to show how an important discoverer or inventor used research  1.b. Use prior research to invent a new idea or product	
B.12.5. Explain how science is based on assumptions about the natural world and themes that describe the natural world	1. Give examples of assumptions or laws about the natural world  2. Explain how an assumption or law affects science	1.a. Complete experiments based on assumptions or laws and record the represented assumptions or laws  2.a. Choose a law or assumption and demonstrate through pictures, words or experiments how it affects science	